

TYPHOON DOT (17W)

I. HIGHLIGHTS

Dot developed in the monsoon trough at the same time as Tropical Storm Cecil (18W) and brought enhanced southwesterly wind flow and heavy rains across Guam. Later, as Dot crossed central Taiwan, torrential monsoon rains from the associated monsoon surge caused extensive flooding in northern Luzon. During its passage across Taiwan and the Fujian Province of China, surface winds in the Formosa Strait exceeded 50 kt (26 m/sec) for 30 hours.

II. CHRONOLOGY OF EVENTS

- 300600Z - (August) First mentioned on the Significant Tropical Weather Advisory as a weak cyclonic circulation.
- 030100Z - (September) Tropical Cyclone Formation Alert issued due to improved vertical alignment between the low level circulation and the convection.
- 030600Z - First warning prompted by increased convective cloud organization.
- 040600Z - Upgrade to tropical storm based on consolidation of central cloud mass.
- 060000Z - Upgrade to typhoon based on formation of a banding-type eye.
- 070000Z - Peak intensity - 80 kt (41 m/sec) - as deep convection around a ragged eye increased.
- 071800Z - Downgraded to tropical storm due to the effects of mountainous terrain in central Taiwan.
- 080000Z - Upgraded to typhoon as eye redeveloped over the Formosa Strait.
- 081200Z - Final warning - dissipated - after Dot moved over land.

III. TRACK AND MOTION

The disturbance which later became Dot generated in the eastern extension of an active monsoon trough. Initially, Dot's cloud system center remained poorly organized and difficult to position. Consequently, six of the first seven warnings on the tropical cyclone were relocated as the convection fluctuated between the multiple circulation centers in the broad monsoon trough (Figure 3-17-1). After

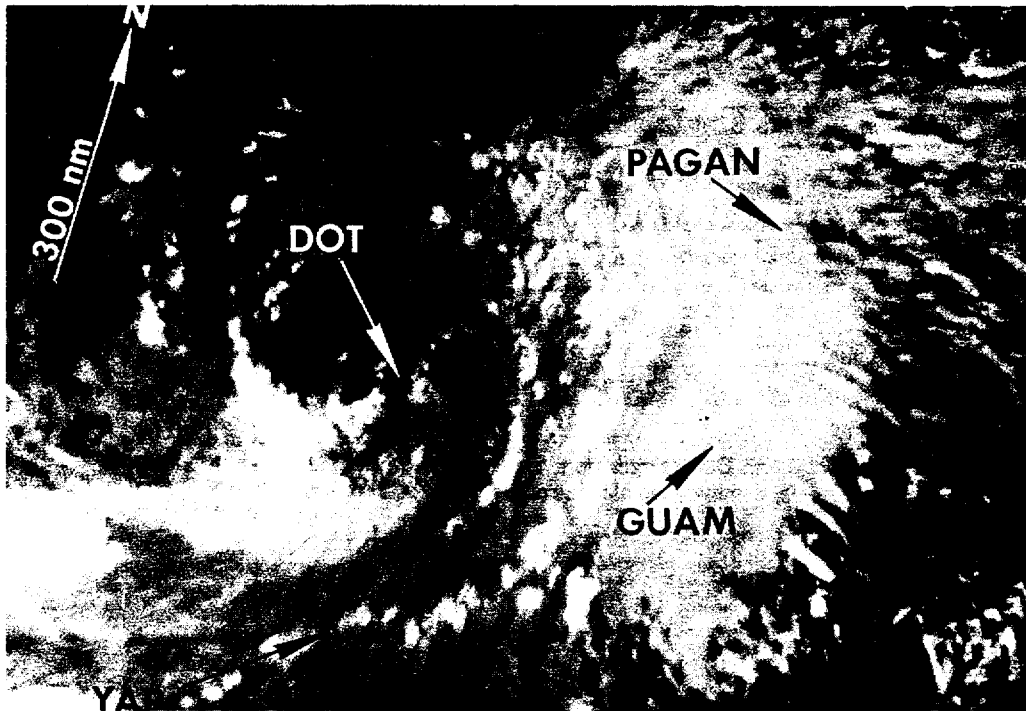


Figure 3-17-1. The broad circulation associated with Tropical Depression 17W extends over 300 nm (483 km) from its poorly defined circulation center (040423Z September NOAA visual imagery).

consolidation took place on 5 September (Figure 3-17-2), Dot tracked steadily west-northwestward south of the subtropical ridge, crossed central Taiwan and dissipated over Fujian Province in southeastern China.



Figure 3-17-2. Tropical Storm Dot emerges from the monsoon trough and begins to consolidate around a single, dominant circulation center (042232Z September NOAA visual imagery).

IV. INTENSITY

As a broad monsoon depression, Dot intensified at a rate of only 5 kt (3 m/sec) per day in its early stage of development. As the upper-level shear across the system diminished, convection increased around the circulation center, and a faster rate of intensification commenced. After becoming a tropical, Dot intensified at a steady rate of 20 kt (10 m/sec) per day prior to landfall in Taiwan. At maximum intensity, Typhoon Dot had a ragged eye approximately 25 nm (40 km) in diameter (Figure 3-17-3).

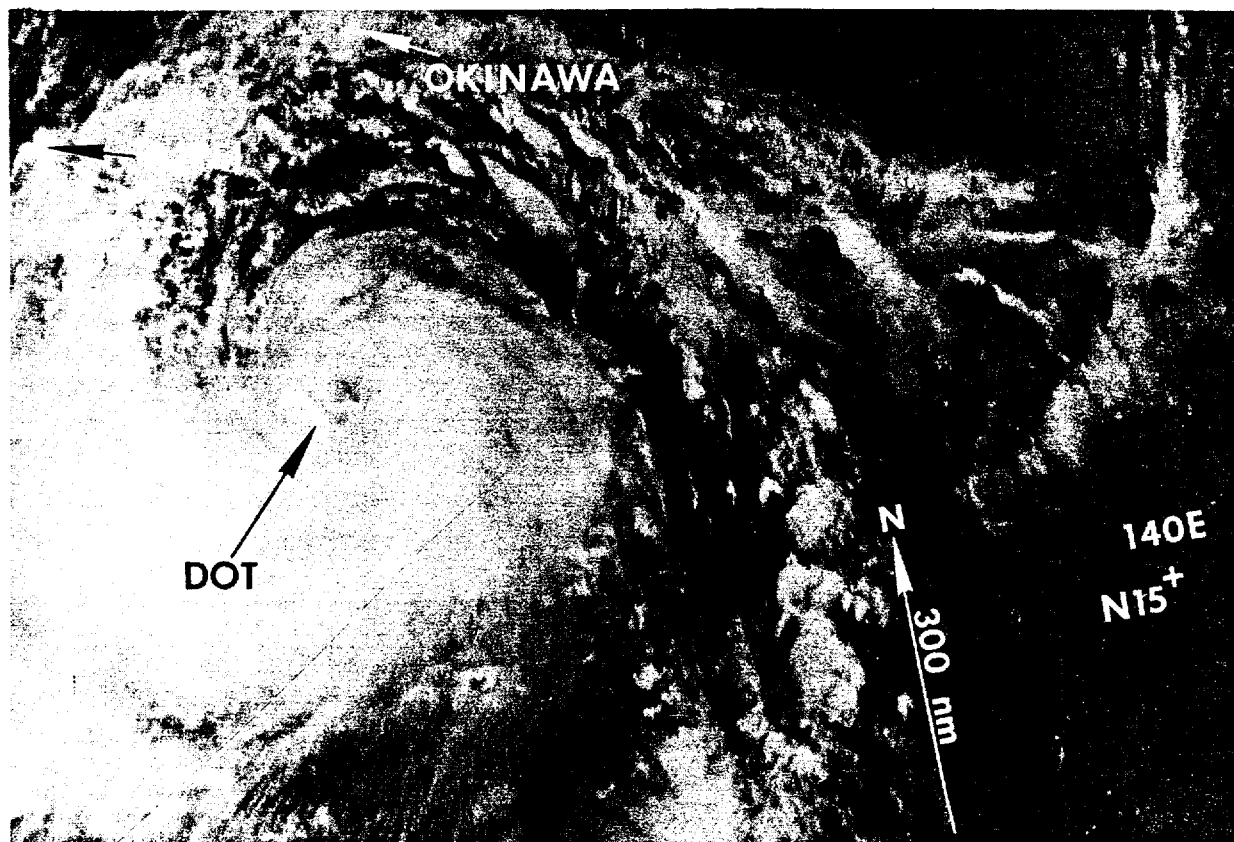


Figure 3-17-3. Typhoon Dot 11 hours prior to reaching maximum intensity east of Taiwan (061251Z September DMSP visual imagery)

Dot weakened significantly over the mountainous terrain of central Taiwan, then reintensified in the Formosa Strait. Dot's ragged eye was visible on radar (Figure 3-17-4) prior to landfall south of Zhangzhou in southern China.

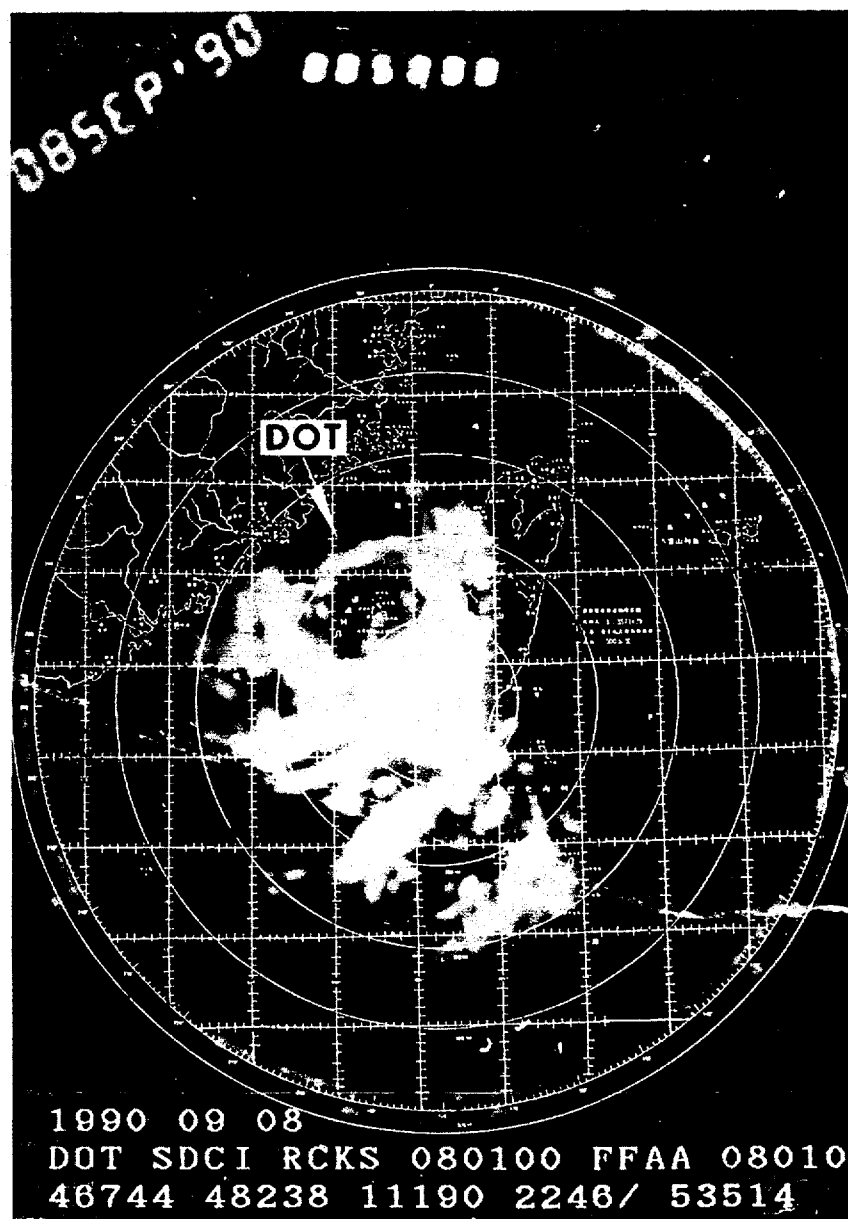


Figure 3-17-4. Evidence of redevelopment of an eye after Typhoon Dot passed across central Taiwan as seen by radar at Kaohsiung (WMO 46744) at 080100Z September (Photograph courtesy of Central Weather Bureau, Taipei, Taiwan).

V. FORECASTING PERFORMANCE

The overall JTWC forecast performance is shown in Figure 3-17-5. Uncertainty about Dot's motion on 4 September resulted in larger forecast errors, but once its motion was more clearly established, JTWC forecast a west-northwestward track south of the subtropical ridge.

VI. IMPACT

Heavy rains from convergent low-level wind flow into Dot caused flooding on Guam, Luzon and Taiwan. The floods in northern Luzon caused the deaths of four people and the evacuation of an estimated 65,000 more. At least three deaths were reported in Taiwan.

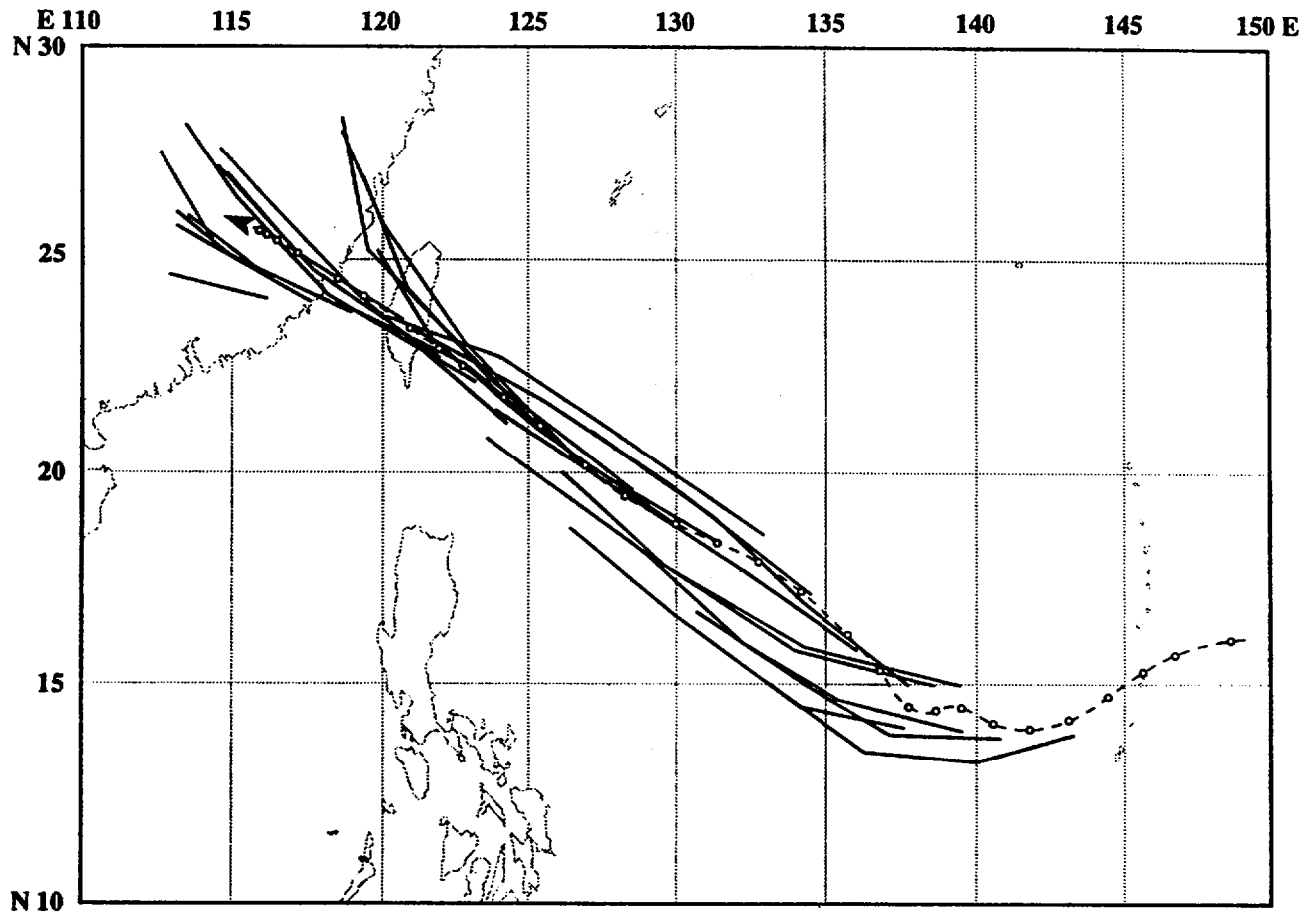


Figure 3-17-5. Summary of JTWC forecasts (solid lines) for Dot superimposed on the final best track (dashed line).